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ABSTRACT

A general model of academic self-regulation is proposed that emphasizes the roles of goals, self-efficacy, and learning strategies. Within this framework, the contributions of two variables hypothesized to affect self-regulation are highlighted. One variable is strategy value information, or information about the usefulness of a strategy as an aid to performance. The other variable is process goals that involve techniques and strategies students use to learn. The general hypothesis is that providing students with information on the value of a strategy as an aid to performance and a process goal of learning a strategy enhances strategy use, self-efficacy, and skills, more than does providing a product goal of accomplishing work without strategy value information. In support of this hypothesis, research from a number of studies is presented that uses elementary school students as subjects and reading comprehension of main ideas and writing of paragraphs as content domains. Implications of this work for enhancing strategy use during learning are discussed. Three figures illustrate the discussion. (Author/SLD)

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Enhancing Strategy Use: Influences of Strategy Value and Goal Orientation

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Abstract

In this paper I propose a general model of academic self-regulation that emphasizes the roles of goals, self-efficacy, and learning strategies. Within this framework the contributions of two variables hypothesized to affect self-regulation are highlighted. One variable is strategy value information, or information about the usefulness of a strategy as an aid to performance. The other variable is process goals that involve techniques and strategies students use to learn. The general hypothesis is that providing students with information on the value of a strategy as an aid to performance and a process goal of learning a strategy enhances strategy use, self-efficacy and skills, more than does providing a product goal of accomplishing work without strategy value information. In support of this hypothesis research is presented that uses children as subjects and reading comprehension of main ideas and writing of paragraphs as content domains. Implications of this work for enhancing strategy use during learning are discussed.

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Enhancing Strategy Use: Influences of Strategy Value and Goal Orientation

For the past few years I have been conducting research within the framework of social cognitive theory on the role of students' cognitions during academic skill learning. Much of this research is relevant to the topic of self-regulation. I use the term self-regulation to mean the behaviors, cognitions, and emotions, which students instigate, modify, and sustain, to attain their goals. Self-regulation fits well with the contemporary notion that students are not passive recipients of information but rather exert control over the setting and attainment of their learning goals (Pintrich, Cross, Kozma, & McKeachie, 1986).

Specifically I will discuss the operation of three processes postulated by Bandura (1986, 1988) and Zimmerman (1989, 1990) to be important components of self-regulation: goals, self-efficacy, and learning strategies. Goals motivate and inform people about their capabilities (Locke & Latham, 1990). For goals to affect performance, however, it is necessary that people make a commitment to try to attain them. Research also shows that the goal properties of specificity, proximity, and difficulty, heighten their effects. Goals that incorporate specific performance standards increase motivation and performance more than general goals (e.g., "do your best"). Proximal, short-term goals result in greater motivation and higher achievement than distant goals and convey reliable information about capabilities. Learners expend greater effort to attain difficult goals than easier ones, assuming they possess the ability and believe they are capable of attaining the goals.

Self-efficacy refers to personal beliefs concerning one's capabilities to learn or perform skills at designated levels (Bandura, 1986, 1989; Schunk, 1991). Self-efficacy can influence choice of activities, effort, and persistence. Students acquire information about their self-efficacy from their performances, observations of models, forms of social persuasion, and such physiological indexes as sweating and heart rate. Research in different settings shows that self-efficacy helps to explain and predict achievement behaviors.

Learning strategies are systematic plans designed to improve information processing and task performance (Pressley et al., 1990). Strategies help students attend to tasks, focus on important features, organize material, and maintain a productive psychological climate for learning (Weinstein & Mayer, 1986). Self-regulated learners apply strategies and understand how strategies improve their performance. Strategy use presumably can raise self-efficacy, which in turn enhances motivation for self-regulation. Research shows that use of strategies relates positively to achievement and self-efficacy (Borkowski, Carr, Rellinger, & Pressley, 1990); Pintrich & De Groot, 1990; Zimmerman & Martinez-Pons, 1992)

In my thinking, these processes operate together in the manner shown in Figure 1, which portrays a model of self-regulation applicable to academic learning. To simplify I have included only those processes germane to my topic; several potentially important processes, such as student abilities, are not portrayed. The model assumes that students have learning goals and that they receive feedback on their performance and goal progress. As they work on tasks they engage in task-oriented activities that they believe will help them

attain their goals; for example, they rehearse information, integrate new with prior knowledge, expend effort and persist, seek help when needed, and use various learning strategies. They also engage in self-evaluation by comparing their performances with their goals to determine progress. The belief they are making progress validates their self-efficacy and enhances motivation. Task-oriented and self-evaluative activities collectively affect skill acquisition.

Insert Figure 1 about here

In this paper I summarize research on two themes relevant to this model. One theme concerns the role of strategy value information, or information about the usefulness of a strategy as an aid to performance (Paris, Lipson, & Wixson, 1983; Pressley et al., 1990). Simply teaching students to use a strategy does not ensure they will continue to use it. Failure to employ a strategy may result partly from the belief that the strategy, although useful, is not as important as such other factors as time available or effort expended. Strategy value information might engender the belief that one is learning a useful strategy, which can raise self-efficacy and motivate learners to continue applying it (Schunk 1989). Strategy value feedback promotes achievement outcomes and strategy use better than strategy instruction alone (Borkowski, Weyhing, & Carr, 1988; Kurtz & Borkowski, 1987; Paris, Newman, & McVey, 1982).

The second theme involves process goals, or goals involving techniques and strategies students use to learn. Much goal setting research has used such product goals as rate or quantity of work (Locke & Latham, 1990). An important type of process goal is to learn to apply a strategy. Although process and product goals may possess similar goal properties (i.e., specific, proximal, difficult but attainable) they might differ in their effects on self-regulation. A process goal should highlight strategy use as a means to improve skills. When students believe they are acquiring a useful strategy they may feel they have greater control over their learning (Schunk, 1989). Research shows that perceived strategy usefulness can motivate students to apply the strategy, and strategy use promotes skill acquisition (Baker & Brown, 1984; Borkowski, 1985). In contrast, a product goal may not convey the same strategy importance. Learners who believe a strategy does not contribute much do not employ it systematically or feel confident about learning (Borkowski, Johnston, & Reid, 1987; Paris et al., 1982).

In this paper I summarize some research investigating the effects of strategy value information and process goals on students' achievement outcomes and self-regulated strategy use. The hypothesis tested is that providing students with information on the value of the strategy as an aid to performance and a process goal of learning a strategy enhances strategy use, self-efficacy, and skills, more than does providing a product goal of accomplishing work without strategy value information.

This research employed a similar methodology. Initially we pretested children on self-efficacy and skill in the content area. I will discuss research on reading comprehension of main ideas and writing of paragraphs. Students then were assigned to experimental conditions and received

instruction over several sessions. The instructional format was similar to what they typically received in their classes. As part of the instruction students were taught a multi-step strategy, shown in Figure 2. Experimental treatments involving process goals and strategy value feedback were implemented during instruction. Students were posttested on completion of training. We assessed strategy use in two ways: (a) with a self-report instrument, and (b) during a think-aloud session in which students were given a passage to comprehend or a paragraph to write and verbalized aloud while working. In some studies we included a maintenance test six weeks after completing of training.

Insert Figure 2 about here

Let me begin with reading comprehension. In 1987 Jo Mary Rice and I reported two studies in which we explored how different sources of strategy value information influence self-efficacy and skill (Schunk & Rice, 1987). The subjects were fourth- and fifth-grade remedial readers who scored at or below the 20th percentile on standardized reading tests.

In the first study we provided students with either specific strategy value information, general information, specific plus general information, or no information. In the specific information condition, the teacher stated at the start of each session that strategy use should help students whenever they had to answer questions about main ideas. In the general condition the teacher stated that strategy use should help students whenever they had to answer questions about passages they read. We felt that stressing either the specific or general usefulness of a strategy would be effective, and we wanted to know whether combining the two led to greater benefits. Providing children with both forms of strategy value information led to the highest self-efficacy and skill; the other three conditions did not differ.

In Study 2, we compared the specific information treatment with a strategy value feedback treatment in which children periodically received feedback linking their improved performance with strategy use (e.g., "You got it right because you followed the steps in the right order"). The results were strikingly similar to those of Study 1. Combining specific information with strategy feedback led to the highest self-efficacy and skill. Taken together, these two studies showed that remedial readers benefit from multiple sources of strategy value information.

Rice and I recently explored the process whereby strategy value feedback exerts its effects (Schunk & Rice, 1992). We assigned remedial readers to one of three conditions: strategy instruction, strategy feedback, instructional control. Children in the first two conditions were taught the strategy; controls received comparable instruction in locating main ideas but were not taught the strategy. Strategy feedback subjects periodically received the feedback as described earlier. We included a maintenance test and a think-aloud procedure designed to assess strategy use.

The strategy feedback condition outperformed the other two on self-efficacy and skill, and gains maintained themselves on the maintenance test. During the think-aloud assessment, strategy instruction and strategy

feedback subjects verbalized more strategic steps than controls, and strategy feedback children verbalized more steps than strategy instruction students. Thus, strategy value feedback promoted strategy use and maintenance of self-efficacy and skill gains.

Now I will discuss some process goal research. In 1989 Rice and I conducted a study in which we assigned children to one of three conditions: process goal, product goal, instructional control (Schunk & Rice, 1989). All children were trained to use the strategy. At the start of each session, process-goal students were told that an important goal of the sessions was for them to learn to use the strategy's steps to answer questions about what they read. Product-goal students were told that an important goal was to answer questions about what they've read. Instructional control students were simply told to work their best.

Results indicated that process- and product-goal conditions did not differ on self-efficacy or skill but outperformed the controls on both measures. Students also judged the how important certain goals were during the instructional sessions. Process-goal students judged "learning to use the steps" and "becoming a better reader" more important than product-goal students and "learning to use the steps" more important than control subjects. Both the process and product goals were specific, proximal, and difficult but attainable. It also is possible that process-goal students had difficulty determining how well they were attaining their goal and whether strategy use was improving their performance. Process-goal students never received feedback on how well they were learning the strategy or that it was improving their work. They may have gauged efficacy in the same way as product-goal students—by how well they were answering questions.

In 1991 we replicated this study except we replaced the control condition with a process goal plus strategy value feedback treatment (Schunk & Rice, 1991). The feedback was similar to the strategy value feedback discussed earlier. The process goal plus feedback condition outperformed the process goal and product goal conditions on self-efficacy and skill. Process goal plus feedback and process goal subjects judged their progress in learning to use the strategy greater than product-goal subjects. The process goal plus feedback condition included strategy instruction, a goal of learning the strategy, and feedback on goal progress. These factors motivate students to learn, teach them a means of improving their achievement, convey information that they are learning the strategy, and imply that strategy use is helping improve their performances.

Now I will discuss three studies Carl Swartz and I recently completed with children's paragraph writing. In the first experiment, fifth graders who received language arts instruction in regular classes practiced writing various types of paragraphs over sessions (Schunk & Swartz, in press-a). Students were assigned to one of four conditions: product goal, process goal, process goal plus progress feedback, control. For process goal students we stressed the goal of learning to use the strategy to write paragraphs; for product goal students we stressed the goal of writing paragraphs. In the feedback condition, students periodically received feedback linking writing progress with strategy use.

Process goal plus feedback students judged self-efficacy higher than product goal and control students, and process goal subjects judged efficacy higher than controls. On writing skill, all conditions outperformed controls and the process goal and process goal plus feedback conditions demonstrated higher skill than product goal students.

We attempted to replicate these results in a second study. We used fourth graders, included as measures of generalization on the tests two types of paragraphs that were not covered during instruction, administered the think-aloud procedure to determine strategy use, included a self-reported measure of strategy use, and gave a maintenance test six weeks after the posttest.

The results showed that process goal plus feedback students judged self-efficacy higher than the controls. On writing skill, process goal plus feedback children scored higher than controls and product-goal students; process goal children also scored higher than controls. Effects maintained themselves six weeks later. Process goal plus feedback students reported greater strategy use than the controls on the posttest and maintenance test, and greater strategy use than product goal students on the posttest. On the think-aloud assessment, process goal plus feedback students employed more strategic steps and demonstrated higher writing skill than the controls.

The final study I will summarize was conducted with fourth graders who had been identified by the school district as academically gifted in language arts (Schunk & Swartz, in press-b). We replicated the methodology of Schunk and Swartz (in press-a) but included only three conditions: process goal, process goal plus feedback, product goal. We also investigated students' goal orientations. This focus was motivated by research showing that students' academic engagement is motivated by sets of goals (Ames, 1992; Dweck & Leggett, 1988; Meece, Blumenfeld, & Hoyle, 1988; Nicholls, 1983). We were particularly interested in task and ego orientations. Task oriented students are concerned about learning and improving their skills, they adopt learning goals, and they believe that ability is enhanced through effort. Ego oriented students are concerned about their ability as it compares with that of others. They adopt goals of working well enough so teachers and peers will believe they are competent. We felt that the process goal and strategy value feedback treatments might foster a task orientation because they emphasized progress, the development of competence, and the effectiveness of the strategy in promoting learning.

Process goal plus feedback students judged efficacy higher than product goal students. Process goal plus feedback subjects reported greater strategy use than subjects in the other two conditions. Process goal and process goal plus feedback students demonstrated higher skill than product goal children. Process goal and process goal plus feedback children scored higher than product goal students on task orientation. Process goal plus feedback students scored lower on ego orientation compared with the other two conditions. Changes were maintained over six weeks.

Collectively, this research shows beneficial effects of combining a learning process goal with feedback on the value of the strategy in producing better performances. Process goals alone yield some benefits compared with

product goals but these are weak compared with the effects of process goals plus strategy feedback.

We are beginning to determine how these benefits occur. Process goals and strategy feedback highlight strategy use as a means to improve skills. Students who believe they are learning a useful strategy are apt to feel efficacious and motivated to regulate their performances by applying the strategy diligently. Both procedures also convey progress information to students, which helps validate their self-efficacy. In contrast, no explicit goal, a product goal of completing work, and no feedback about the value of the strategy, do not convey the same strategy importance. Research shows that learners who do not believe a strategy contributes much to their achievement do not employ it systematically or feel confident about learning (Borkowski, 1985; Borkowski et al., 1990).

More work is needed to determine the process whereby self-regulatory activities operate during learning and the factors that influence them. We should investigate students' learning over extended periods. Our projects were short; those that included a think-aloud assessment did so in one session. Transcripts of students working over extended periods, along with periodic assessments of self-efficacy and skills, can determine changes in strategy use and other outcomes. This research also could test the theoretical notion that goals and feedback affect self-regulation in part through the intervening influence of self-efficacy (Bandura, 1988; Schunk, 1991; Zimmerman, 1990).

This research has implications for classroom practice because it provides evidence on the effectiveness of procedures, which teachers may find useful in designing instruction. Many strategy training programs improve skills, but students discontinue using the strategy when no longer required to apply it. How can we improve students' use of strategies, and thereby their skills and achievement beliefs?

Strategy use depends on four conditions being met (Figure 3). Students must learn the strategy and understand <u>how</u> to apply it. They not only must know the various steps in the strategy, they also must understand the procedure for putting those steps into practice. Second, students must understand the range of situations in which the strategy can be applied. Knowing how to apply a strategy will not guarantee its use unless students also know <u>when</u> to apply it. Third, students must believe that applying the strategy will improve their performances. Knowing how and when to apply a strategy must be coupled with the belief that using the strategy will produce better outcomes than not using it. Finally, they must believe that they can successfully apply the strategy. Research shows that students who do not possess a basic sense of efficacy for successfully applying a strategy will not apply it systematically even when the other conditions are met.

Insert Figure 3 about here

The research methods employed in the projects I summarized addressed each of these points. Condition 1 was dealt with by teaching students the strategy and by having them practice using it. We addressed condition 2 by having

students use the strategy with different types of passages to comprehend or paragraphs to write. The strategy feedback was explicitly designed to satisfy condition 3. Finally, many aspects of our instructional programs were designed to raise efficacy. Teaching students a strategy and having them apply it to different content can convey to them that they are learning a useful strategy that improves their work on different tasks. Performance feedback on the accuracy of their work—which all students received—and strategy feedback on their improvement in using the strategy both convey that they are learning and improving their skills. Learning process goals provide standards against which students can compare their present work. The belief that they are making progress in learning validates their sense of efficacy and motivates them to continue to improve.

I do not wish to imply that learning process goals and strategy feedback are the only means of helping to ensure continued strategy use. Any procedure that satisfies these four conditions will have similar effects. Researchers have identified numerous practices that encourage strategy use to include maintenance and generalization (Borkowski, 1985; Graham & Harris, 1989; Pressley et al., 1990). In previous studies I have examined the effects of such classroom variables as peer models, attributional feedback, progress-contingent rewards, and self-monitoring of progress (Schunk, 1989). Teachers can incorporate strategy training, along with goals, feedback, models, and the like, into classroom instruction to help promote students' self-regulated strategy use and achievement outcomes.

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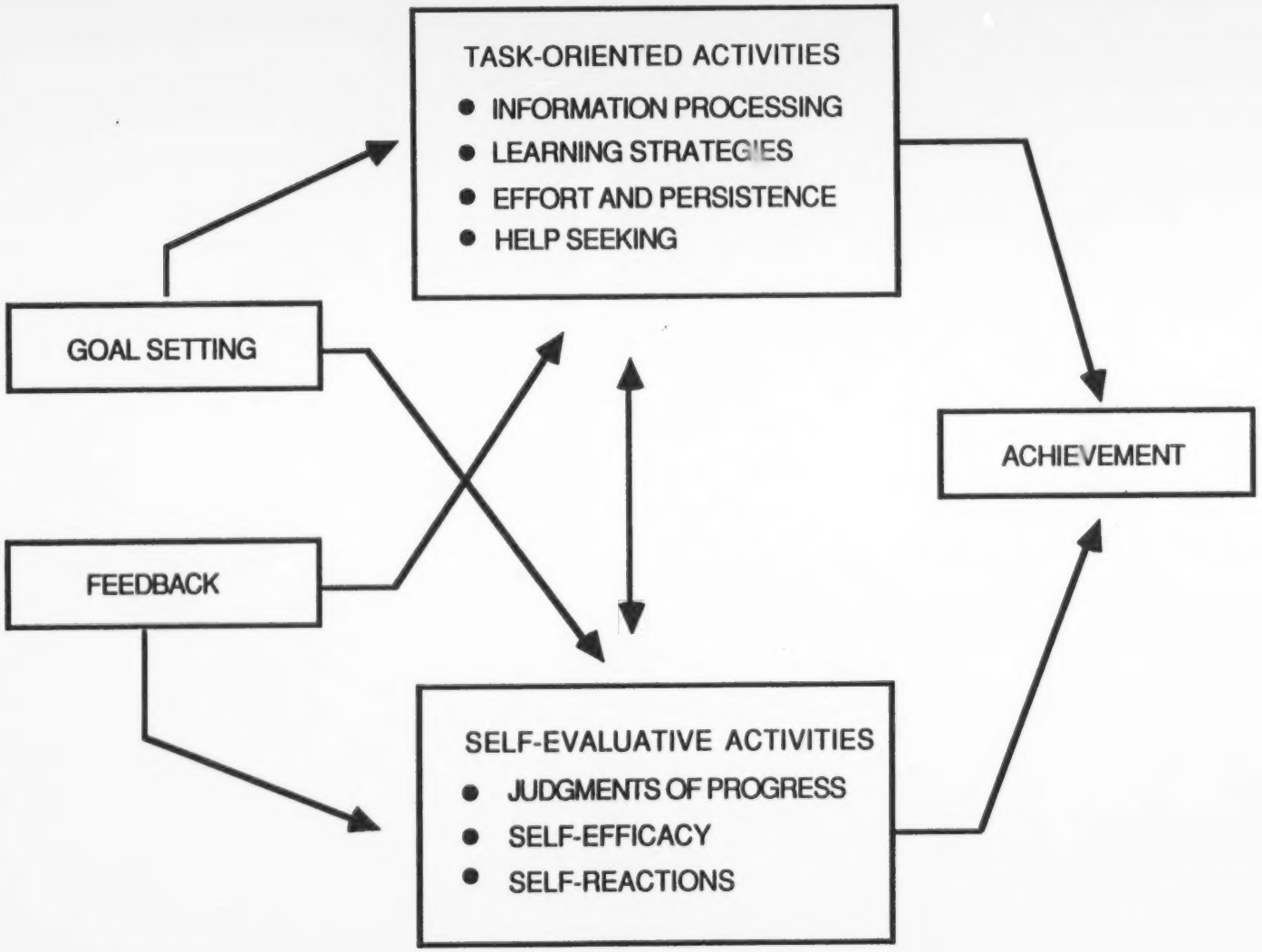
Figure Captions

Figure 1. Model of self-regulation for academic learning.

Figure 2. Strategies for reading comprehension of main ideas and paragraph writing.

Figure 3. Factors affecting strategy use.


TASK-ORIENTED ACTIVITIES
INFORMATION PROCESSING
LEARNING STRATEGIES
EFFORT AND PERSISTENCE
HELP SEEKING
GOAL SETTING
FEEDBACK
ACHIEVEMENT
SELF-EVALUATIVE ACTIVITIES
JUDGMENTS OF PROGRESS
SELF-EFFICACY
SELF-REACTIONS

STRATEGIES

READING COMPREHENSION - MAIN IDEAS

WHAT DO I HAVE TO DO?

1. READ THE QUESTIONS.
2. READ THE PASSAGE TO FIND OUT WHAT IT IS MOSTLY ABOUT.
3. THINK ABOUT WHAT THE DETAILS HAVE IN COMMON.
4. THINK ABOUT WHAT WOULD MAKE A GOOD TITLE.
5. REREAD THE STORY IF I DON'T KNOW THE ANSWER TO THE QUESTION.

PARAGRAPH WRITING

WHAT DO I HAVE TO DO?

1. CHOOSE A TOPIC TO WRITE ABOUT.
2. WRITE DOWN IDEAS ABOUT THE TOPIC.
3. PICK THE MAIN IDEA.
4. PLAN THE PARAGRAPH.
5. WRITE DOWN THE MAIN IDEA AND THE OTHER SENTENCES.

FACTORS AFFECTING STRATEGY USE

STUDENTS MUST:

- KNOW HOW TO APPLY THE STRATEGY
- UNDERSTAND WHEN TO APPLY THE STRATEGY
- BELIEVE THAT STRATEGY USE IMPROVES PERFORMANCE
- BELIEVE THAT THEY CAN APPLY THE STRATEGY EFFECTIVELY